DOE/NV/25946--383

Reliable And Repeatable Characterization Of Optical Streak Cameras

Michael R. Charest Jr.[1], Peter Torres III[2], Christopher Silbernagel[3], Daniel Kalantar[4]

[1,2,3] *National Security Technologies, LLC, Livermore Operations, PO Box 2710, Livermore, CA USA 94551*
[4]*Lawrence Livermore National Laboratory, PO Box 808, Livermore, CA USA 94550*
1 925 960-2583, charesmr@nv.doe.gov

Abstract. Optical streak cameras are used as primary diagnostics for a wide range of physics and laser performance verification experiments at the National Ignition Facility (NIF). To meet the strict accuracy requirements needed for these experiments, the systematic nonlinearities of the streak cameras (attributed to nonlinearities in the optical and electronic components that make up the streak camera system) must be characterized. In some cases the characterization information is used as a guide to help determine how experiment data should be taken. In other cases the characterization data is used to "correct" data images, to remove some of the nonlinearities. In order to obtain these camera characterizations, a specific data set is collected where the response to specific known inputs is recorded. A set of analysis software routines has been developed to extract information such as spatial resolution, dynamic range, temporal resolution, etc., from this data set. The routines are highly automated, requiring very little user input and thus provide very reliable and repeatable results that are not subject to interpretation. An emphasis on quality control has been placed on these routines due to the high importance of the camera characterization information.

This work was done by National Security Technologies, LLC, under Contract No. DE-AC52-06NA25946 with the U.S. Department of Energy. This work was done under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.